CLAIMS

1.   A wavelength division multiplexed optical network having nodes coupled by links, to enable wavelengths to be routed across the network, the nodes being arranged to carry out a restoration process to re-route one or more of the wavelengths, the restoration process having the steps of: sending messages between the nodes to dynamically determine possible restoration routes, and re-routing each wavelength along a chosen one of the possible restoration routes.

2.   The network of claim 1, the nodes being arranged to make the choice of restoration route on the basis of optical parameters of the possible restoration routes.

3.   The network of claim 2, the nodes being arranged to make the choice of restoration route additionally on the basis of optical parameters of the remainder of the path for the given wavelength.

4.   The network of claim 1, the nodes being arranged to make the choice of restoration route on the basis of optical parameters of the remainder of the path for the given wavelength.

5.   The network of claim 1, the nodes being arranged to switch traffic from one wavelength to a different wavelength, and the restoration process having the step of choosing a wavelength within that route.

6.   The network of claim 1, the nodes being arranged such that a node local to a fault makes the choice of which of the possible restoration paths to choose.

7.   The network of claim 1, the nodes being arranged to reserve bandwidth on the restoration routes only after the choice from the possible restoration paths, has been made.

8.   The network of claim 1, the nodes being arranged to make a separate search for possible restoration paths, for each wavelength or bands of wavelengths, to be restored.

9.   The network of claim 1, the nodes being arranged to send messages along the chosen restoration path to reserve the bandwidth, and if there is insufficient bandwidth, choose another of the possible restoration routes.

10.   The network of claim 1, the nodes being arranged to choose a restoration path which rejoins the original path at a node not adjacent to the fault.

11.   A node for use in a wavelength division multiplexed optical network having many such nodes coupled by links, to enable wavelengths to be routed across the network, the node being arranged to carry out a restoration process to re-route one or more of the wavelengths, the restoration process having the steps of: sending messages between the nodes to dynamically determine possible restoration routes, and re-routing each wavelength along a chosen one of the possible restoration routes.

12.   The node of claim 11, arranged to carry out the steps of sending out search messages, or choosing between possible restoration routes.

13.   The node of claim 12, arranged to carry out the steps of a Selector candidate, of identifying a possible restoration path which bypasses the nodes adjacent to a fault, and alerting the node arranged to carry out the choosing step.

14.   The node of claim 11, being arranged to make the choice of restoration route on the basis of optical parameters of the possible restoration routes.

15.   The node of claim 14, the optical parameters comprising one or more selected from chromatic dispersion, polarisation mode dispersion, optical signal to noise ratio, optical power loss.

16.   The node of claim 14, arranged to collect the optical parameters from the nodes along the possible restoration routes, to make the choice of restoration route.

17.   The node of claim 16, arranged to use the messages additionally to carry out the collection of the optical parameters.

18.   The node of claim 14, being arranged to make the choice of restoration route additionally on the basis of optical parameters of the remainder of the path for the given wavelength.

19.   A node for use in a wavelength division multiplexed optical network having many such nodes coupled by links, to enable wavelengths to be routed across the network, the node being arranged to carry out a restoration process to re-route one or more of the wavelengths, the restoration process having the steps of: sending messages between the nodes to dynamically determine possible restoration routes, collecting optical parameters of each possible restoration route, and re-routing each wavelength along one of the possible restoration routes, chosen on the basis of at least the collected optical parameters, and the node being arranged to cooperate with other nodes, and carry out the step of sending out the messages, or the step of making the choice between possible restoration routes.

20.   The node of claim 19, being arranged to make the choice of restoration route additionally on the basis of optical parameters of the remainder of the path for the given wavelength.

21.   Software for use in a node of a wavelength division multiplexed optical network having many such nodes coupled by links, to enable wavelengths to be routed across the network, the software being arranged to carry out a restoration process to re-route one or more of the wavelengths, the restoration process having the steps of: sending messages between the nodes to dynamically determine possible restoration routes, and re-routing each wavelength along a chosen one of the possible restoration routes.

22.   A sequence of data signals on a link of a wavelength division multiplexed optical network having many nodes coupled by such links, to enable wavelengths to be routed across the network, the nodes being arranged to carry out a restoration process to re-route one or more of the

wavelengths, the restoration process having the steps of: sending messages between the nodes to dynamically determine possible restoration routes, and re-routing each wavelength along a chosen one of the possible restoration routes, the data signals comprising at least some of the messages, and signals for controlling the re-routing.

23. A method of transmitting data over a wavelength division multiplexed optical network having many nodes coupled by links, to enable wavelengths to be routed across the network, the nodes being arranged to carry out a restoration process to re-route one or more of the wavelengths, the restoration process having the steps of: sending messages between the nodes to dynamically determine possible restoration routes, and re-routing each wavelength along a chosen one of the possible restoration routes, the method having the steps of using the nodes to transmit the data over an original path or, following the restoration process, over a re-routed path.